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WIZ6000 User's Manual

(Version 1.0)

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Document Revision History

Date	Revision	Changes
2010-03-15	V1.0	Release

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Certification Information

CE for Class B ITE

INFORMATION TO THE USER
Hereby, WIZnet. Declares that this WIZ6000 is in compliance with the essential requirements and other relevant provisions of directive 1999/5/EC.

WARNING: This is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC for Class B ITE

INFORMATION TO THE USER
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no Guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING: This equipment may generate or use radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

KCC for Class B ITE

INFORMATION TO THE USER
This equipment has been tested for a Class B digital device.

- Trade Name or Applicant : WIZnet, Inc.
- Equipment Name : Serial to Wireless LAN Device Server
- Basic Model Number : WIZ6000
- Manufacturer / Country of Origin : WIZnet, Inc. / KOREA
- Certification Number : WWW-WIZ6000-S2W(B)

WARNING: This equipment may generate or use radio frequency energy. Changes or modifications to this equipment may cause harmful interference.

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WIZnet's Online Technical Support

If you have any questions about our products, please visit our website and submit your questions on the Q&A Board. We will reply your questions as soon as possible

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1. Introduction

WIZ6000 is the external gate way module which provides a bridge for RS-232 or Ethernet to IEEE802.11 b/g wireless communications. Devices with the interface of RS-232C serial or Ethernet can established a wireless network which can enable remote monitoring, management and controlling.

WIZ6000 has been designed by using WIZ610wi WiFi module. Therefore all functions and operations are identical with WIZ610wi.
Refer to the 'WIZ610wi User Manual' for detail description.

Main Features

- Embedded 802.11b/g Wireless Networking
- Access Point, Client, Gateway, Serial to WLAN mode Supported
- Ethernet to Wireless Bridging
- Strong Security with 64/128 bit WEP, WPA, WPA2(AES), SSL
- Support Ethernet port, Serial port, Reset Button
- Ready to use serial to wireless application
- Max 25Mbps Data Streaming
- Compact design 90.5mm X 94.5mm X 22.7mm (L x W x H)
- RoHS Compliant
- CE, FCC and KCC certificated

1.1 Products Contents

	WIZ6000 Device Server Included Dipole Antenna (2.5dBi SMA Type)
	Serial Cable
	Network Cable (Crossover Cable)
	Power (DC 5V / 2A Adaptor)
	Data CD (Manual, H/W & SW related Materials)

Table 1. Products Contents.

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1.2 Product Specification

Wireless

ITEM	Specification
Wireless Standard	IEEE802.11b/g
Frequency Range	2.412~2.485GHz
Output Power (Tolerance(+/-1dBm)	802.11b: 15dBm@11Mbps (Max 10mW / 1MHz) 802.11g: 13.5dBm@6~54Mbps (Max 10mW / 1MHz)
Receive Sensitivity	802.11b: -65dBm@11Mbps 802.11g: -76dBm@54Mbps
Data Rates	54Mbps-1Mbps
Modulation Type	11g: OFDM(64QAM, 16QAM, QPSK, BPSK) 11b: DSS(CCK, DQPSK, DBPSK)

Table 2. Products Specification – Wireless

Software

ITEM	Specification
Operation Mode	Access Point, Clinet, Gateway, Serial to Wireless LAN
Protocol	ARP, UDP, TCP, Telnet, ICMP, IGMP DHCP, PPPoE, BOOTP, HTTP, TFTP
Security	WEP 64/128big WPA/WPA2 PSK/AES/TKIP 802.1x(Radius) SSL
Management	HTTP, Telnet, Serial, UDP
Notification	Event Logging

Table 3. Products Specification - Software

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Hardware

ITEM	Specification
Interface	Ethernet 1 Port, RS-232C 1 Port, DC 5V Power input
	2.5dBi SMA type Dipole Antenna
Temperature	Operation: -5℃~55℃ Storage: -20℃~70℃
Humidity	Operation: 10% to 90%, Non-Condensing Storage: 5% to 90%, Non-Condensing
Serial (RS-232C)	Baud Rate : 230,400bps
	Stop bits: 1
	Parity: None, Odd, Even
	Flow Control: XON / XOFF (Software), CTS / RTS (Hardware), None
Power	DC 5V input
Power Consumption	Under 600mA (3.3V)
Dimension	90.5mm X 94.5mm X 22.7mm (Excluded antenna size)

Table 4. Products Specification - Hardware

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1.3 WIZ6000 Device server Interface

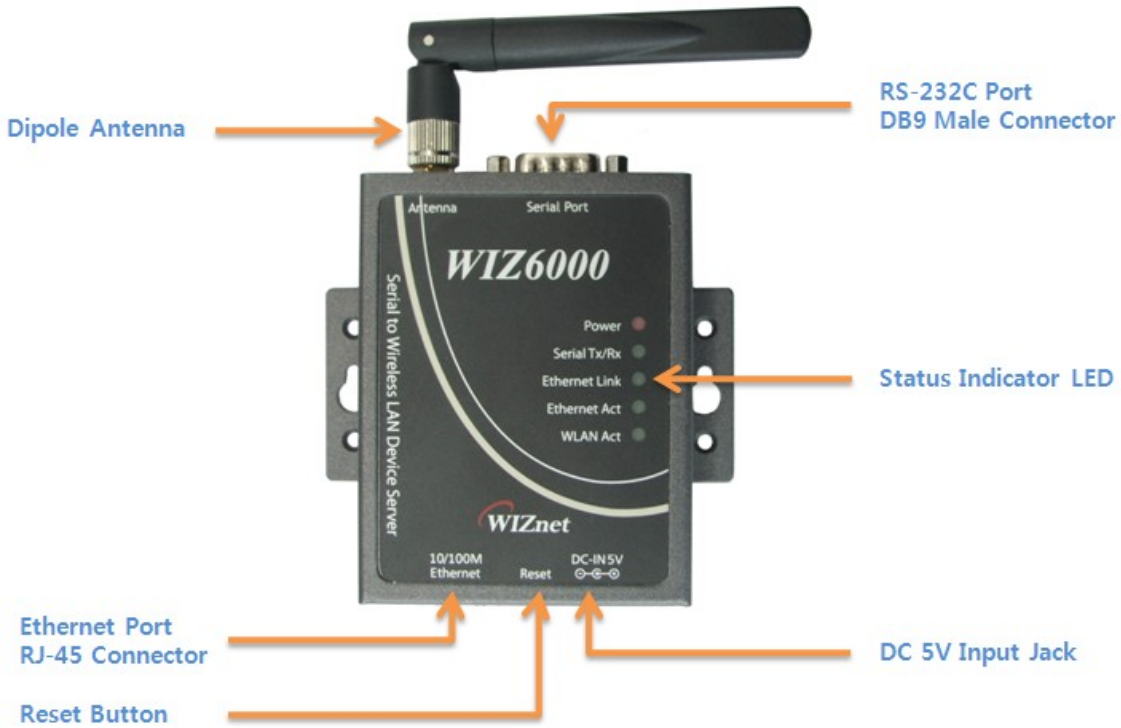

Figure 1. WIZ6000 Device Server Interface

1.3.1 Hardware Installation

- **STEP1:** Connect the WIZ6000 to the HUB or PC by using a network cable.
- **STEP2:** Connect the WIZ6000 to the serial device by using the RS-232C serial cable.
- **STEP3:** Insert the power supply connector to the WIZ6000 by using the 5V / 2A DC power adaptor.
- **STEP4:** Configure the network parameters of WIZ6000 and your PC.

  - The default IP address of WIZ6000 is “192.168.1.254”.

    Your PC’s IP address should start with these three sets of numbers “192.168.1.XXX”.

  - WIZ6000 and PC can be connected through wireless network.

    Connect to WIZ6000 from PC by using default SSID “WLANAP”

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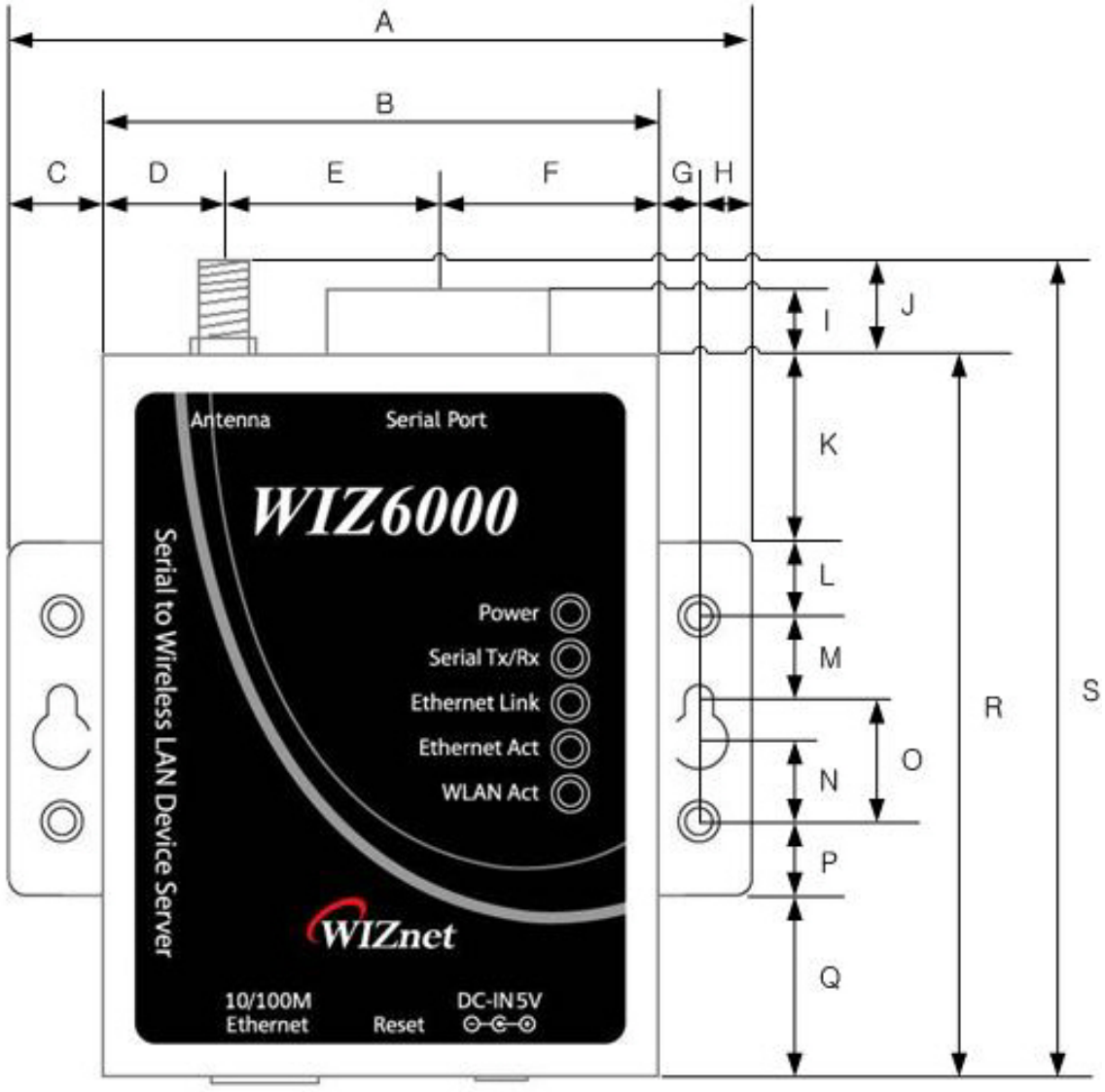
2. Hardware Specification

2.1 WIZ6000 Dimension



A	90.5	B	67.5	C	11.5	D	14.5
E	26.0	F	27.0	G	5.2	H	6.3
I	4.5	J	7.0	K	22.5	L	9.0
M	8.0	N	11.5	O	16.5	P	9.0
Q	22.5	R	87.5	S	94.5		

Figure 2. WIZ6000 Dimensions (unit : mm)

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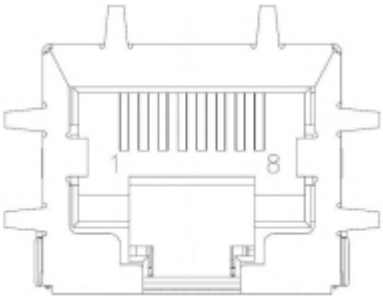
2.2 Connector Specification

2.2.1 RJ-45 Connector

Ethernet port Pin outs

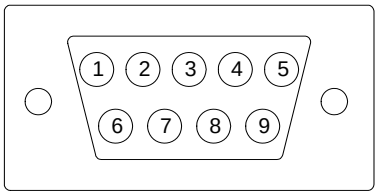


Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Figure 3. RJ-45 PIN Assignment

3.2.2 RS-232C Connector

Serial port Pin outs



Pin Number	Signal	Description
1	H/W Trigger	Hardware Trigger signal Input
2	RxD	Receive Data
3	TxD	Transmit Data
4	EXT_GND	External Power Ground (Internally shorted to GND)
5	GND	Ground
6	NC	Not connect
7	RTS	Request To Send
8	CTS	Clear To Send
9	EXT_VCC	External Power Input (5V) / Optional

Table 5. RS-232 PIN Assignment

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3. Demonstration and Test

In this chapter, an example is provided for you to test the functionality of WIZ6000. The testing environments are the followings:

<Hardware>

- A PC equipped with a RS-232 serial port
- WIZ6000 Device Server
- Connect PC and module's Ethernet port by using an Ethernet Cable (Direct or Crossover)
- Connect PC and module's serial port by using a serial cable

<Software>

- Hyper Terminal (or any other terminal program)

• Step 1.

① Connect the PC and WIZ6000 by using a serial cable.

② Connect the PC and WIZ6000 by using an Ethernet cable.

③ Turn on the power switch of WIZ6000.

• Step 2. : WIZ610wi Environment Setup

① On your PC, go to the "Network Setting" and connect to your WIZ6000 in the "Wireless Network Connection".

② In your web browser, input IP address of WIZ6000 (Default : 192.168.1.254).
If configuration page appears, click "Serial setup" menu and set the serial parameters.

• Step 3. : Data Transmission

① Execute terminal program at the PC. (Ex: Hyper Terminal)

② Set the baud rate as the same value of WIZ6000.

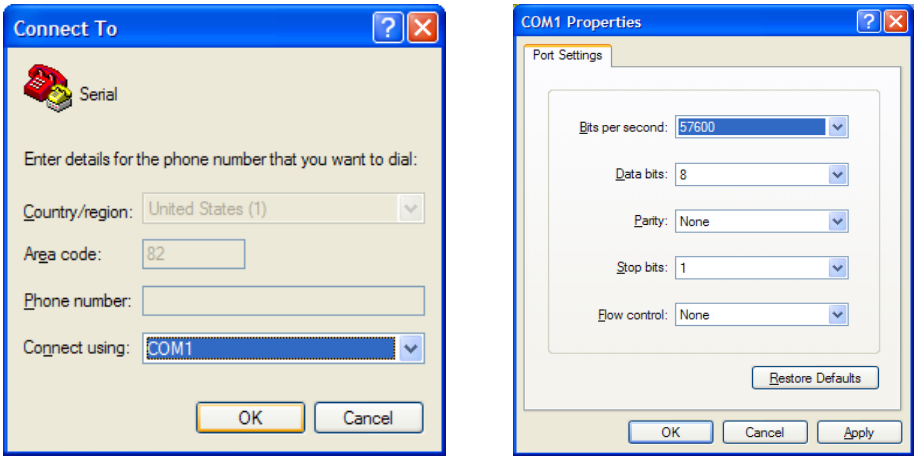

Figure 4. Serial Terminal Program configuration

③ Connect to “WIZ6000” in the Wireless Network Setting of your PC

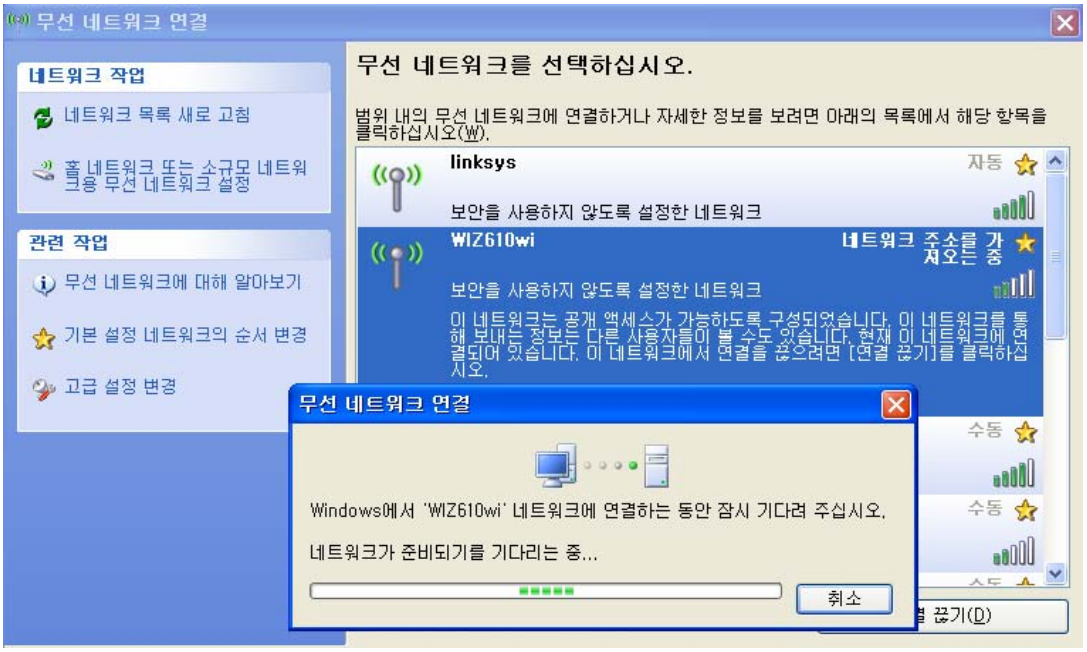

Figure 5. Wireless Network Connection

④ Execute one more terminal program, and set IP address and Port number.

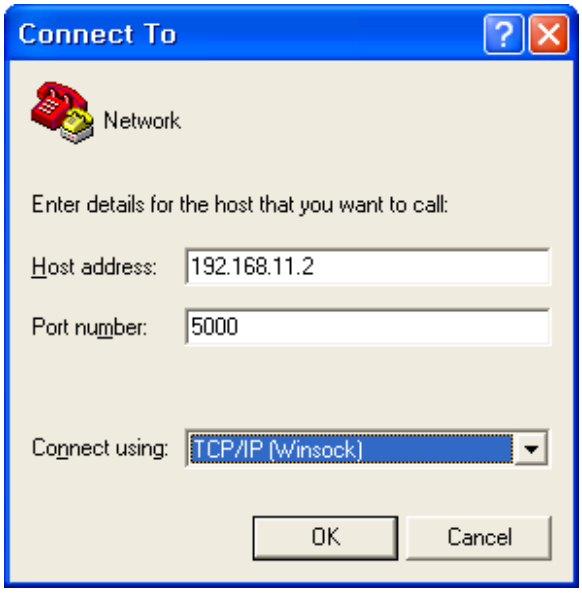

Figure 6. Network Terminal Program configuration

⑤ Input any characters in the Hyper Terminal for Serial. (In the example below, “01234567890” is input).

The same characters are outputted in the Hyper Terminal for Network.

A Serial to Wireless LAN test was performed. (Serial to Ethernet)

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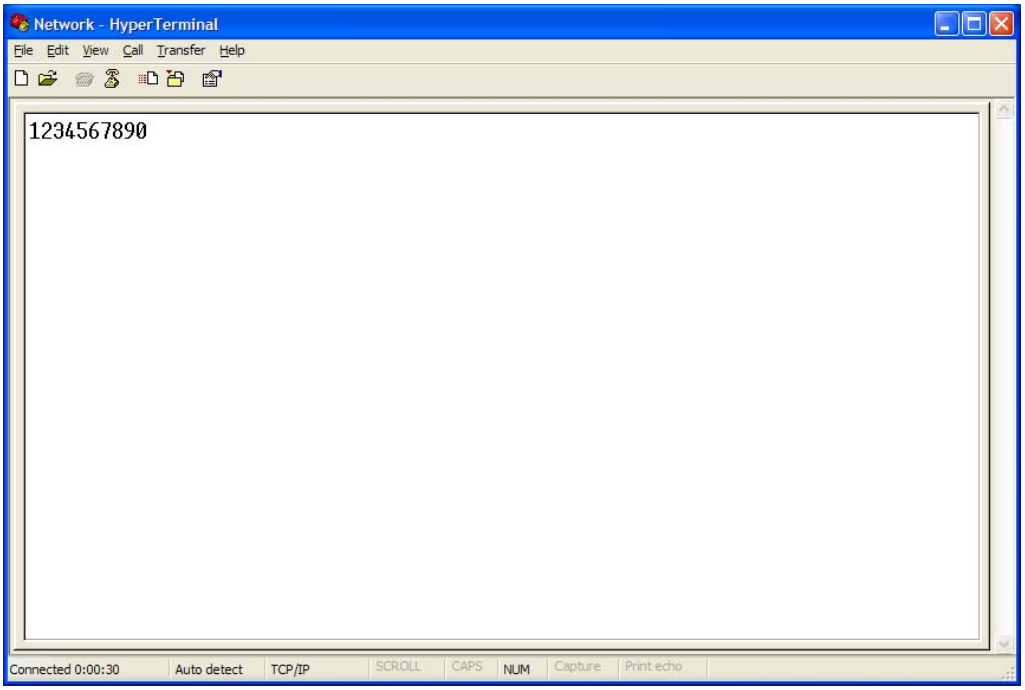

Figure 7. Received Data by Network Terminal Program

Figure 8. Serial to Wireless LAN 구성

⑥ In the same way, input any character at the screen of terminal program for network, and check if same character is displayed at the screen for serial. (Ethernet to Serial)

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※ The above test can also be performed in a program called, “Device Terminal program”, which is easy and simple to use.

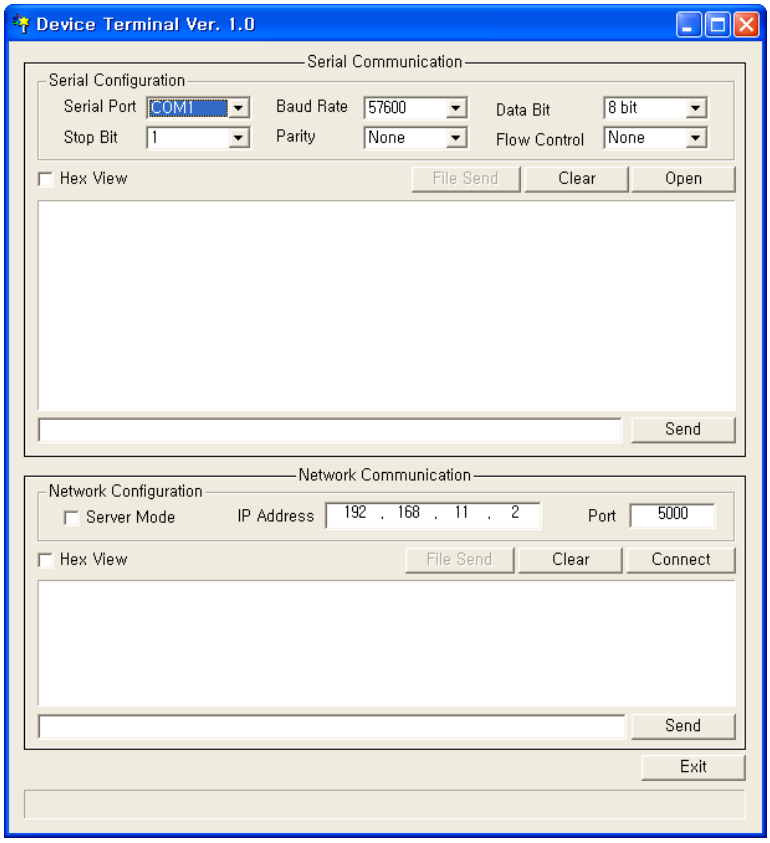

Figure 9. Device Terminal Program

Device Terminal is a program which integrates both serial and network communications into one user interface so that you can test your WIZnet gateway module easily.

As shown in above Figure, the upper part of the program allows you to configure your serial setting of WIZ6000. By clicking the “Open” button, serial communication is enabled.

The lower part of the program allows you to configure the network settings. You can test both TCP Client and TCP Server modes at the same time. If the Server Mode is enabled, Device Terminal will operate as server mode, and the WIZ6000 module will work as client mode. The PC where the Device Terminal is operating will work as a server, the IP address of the PC should be set as Server IP of the module. If Server mode is not checked, Device Terminal will operate as client mode, and the module as server. For the IP address and port, please input your IP address and port number of WIZ6000 and click the “Connect” button to start a network communication.

When serial and network terminals are connected, input any character in the Data Input window and click “Send” button. You can check the data is transferred into the another window.

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4. Serial Configuration

Serial Command Format

It is possible to configure WIZ6000 by using serial command.

RS-232C port's Pin number 1 of WIZ6000 is Hardware trigger pin.

('1': H/W trigger disable, '0': enable)

< Frame Format >

Command Frame format

Descriptor	STX	Command code	Parameter	ETX
Length(bytes)	1	2	Variable	1

Table 6. Serial Configuration Frame format

Reply Frame format

Descriptor	STX	Reply code	Parameter	ETX
Length(bytes)	1	1	Variable	1

Table 7. Serial Configuration Reply Frame format

STX & ETX

Setting	Comments
STX	'<' : Hex = 3Ch
ETX	'>' : Hex = 3Eh

Table 8. Serial Configuration STX & ETX

Reply Code

Reply	Comments
S	Command was successful
F	Command failed
0	Invalid STX
1	Invalid command

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2	Invalid parameter
3	Invalid ETX
E	Enter Serial Command Mode

Table 9. Serial Configuration Reply Code

Command Code

Command	Get/ Set	Comments	Parameter	Time
Network				
RF	Get	Firmware Version	vx.x.x	1
RA	Get	MAC Address	0:Ethernet MAC address, 1:Wireless MAC address, <0xx.xx.xx.xx.xx.xx_1xx.xx.xx.xx.xx.xx>	1
RI	Get	IP Address	<Sxxx.xxx.xxx.xxx>	1
WI	Set	IP Address	<xxx.xxx.xxx.xxx>	2
RS	Get	Subnet Mask	<Sxxx.xxx.xxx.xxx>	1
WS	Set	Subnet Mask	<xxx.xxx.xxx.xxx>	2
RG	Get	Gateway	<Sxxx.xxx.xxx.xxx>	1
WG	Set	Gateway	<xxx.xxx.xxx.xxx>	2
RD	Get	DHCP Server	1:Enable, 0:Disable <Sx>	1
WD	Set	DHCP Server	1:Enable, 0:Disable <x>	2
RH	Get	DHCP Start/End IP	Start address_End address <Sxxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx>	1
WH	Set	DHCP Start/End IP	Start address_End address <xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx>	3
DL	Get	Wireless Active Client List	MAC address_Channel_TxRate_RSSI <Sxxxxxxxxxxxx_xx_xx_xx[:xxxxxxxxxxxx_xx_xx_xx:…]>	1
RL	Get	DHCP Client List	<IP address_MAC address> <Sxxx.xxx.xxx.xxx_xxxxxxxxxxxx[:xxx.xxx.xxx.xxx_xxxxxxxxxxxx:…]>	1
WV	Set	DNS Server	1:Enable, 0:Disable	1

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			<1:xxx.xxx.xxx.xxx[_xx.xx.xx.xx]> or<0>	
RV	Get	DNS Server	1:Enable, 0:Disable_DNS Server IP address <Sx_xxx.xxx.xxx.xxx[_xx.xx.xx.xx]> or<0>	1
RT	Get	WAN Port	0:Static, 1:DHCP Client, 2:PPPoE, 3:PPTP -Static: 0_Ipaddress_Subnet_Gateway_DNS <S0_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx> -DHCP Client: 1_IPaddress_Subnet_Gateway <S1_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx> PPPoE: 2_UserName_Password <S2_User Name_Password> -PPTP: 3_IP_Subnet_Gateway_ServerIP_UserName_Password <S3_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx_UserName_Password>	2
WT	Set	WAN Port	0:Static, 1:DHCP Client, 2:PPPoE, 3:PPTP -Static: 0_Ipaddress_Subnet_Gateway_DNS <0_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx> -DHCP Client: 1 <1> PPPoE: 2_UserName_Password <2_User Name_Password> -PPTP: 3_IP_Subnet_Gateway_ServerIP_UserName_Password <3_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_xxx.xxx.xxx.xxx_UserName_Password>	1
Wireless				
DB	Get	Wireless Band	0: 11b+g, 2: 11b, 3:11g, 6: n, 9:b+g+n <Sx>	1
GB	Set	Wireless Band	0: 11b+g, 2: 11b, 3:11g, 6: n, 9:b+g+n <x>	20
DO	Get	Operation Mode	0:AP, 1:Gateway, 2: AP+WDS, 3:Client <Sx>	1
GO	Set	Operation	0:AP, 1:Gateway, 2: AP+WDS, 3:Client	45

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		Mode	<x>	
DS	Get	SSID	1~32 chars <Sxxxx~>	1
GS	Set	SSID	1~32 chars <xxxx~>	1
DC	Get	Channel	Auto_0, 1~13 <Sx>	1
GC	Set	Channel	Auto_0, 1~13 <x>	2
DW	Get	WDS	1:Master,2:Slave _count_MACaddress_Comment[_MACaddress_Comment_...] <Sx_x_xxxxxxxxxxxx_xxx~>	1
GW	Set	WDS	1:Master, 2:Slave_1:add, 2:delete_count_MACaddress_Comment[_MACaddress_Comment_..] <x_x_x_xxxxxxxxxxxx_xxx~>	1
DP	Get	Tx Power	0: off, 1-16: power(dBm), <Sxx>	1
GP	Set	Tx Power	0: off, 1-16: power(dBm), <xx>	2
DR	Get	Data Rate	<Sxx>	1
GR	Set	Data Rate	<xx>	3
DH	Get	Broadcast SSID	0:Enable, 1:Disable <Sx>	1
GH	Set	Broadcast SSID	0:Enable, 1:Disable <x>	1
DM	Get	WMM	1:Enable, 0:Disable <Sx>	1
GM	Set	WMM	1:Enable, 0:Disable <x>	1
DA	Get	MAC Access Control	0:Disable,1:AllowListed,2:DenyListed[_count[_MACaddress_Comment]] <Sx_x_xxxxxxxxxxx_xxx~>	1
GA	Set	MAC Access Control	0:Disable,1:AllowListed,2:DenyListed[_1:add,2:delete_count_MACaddress_Comment]	5

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			<x_x_x_xxxxxxxxxxx_xxx~>	
DI	Get	Site Survey	SSID_BSSID_Channel_RSSI_Security <Sxxxx_xxxxxxxxxxx_xx_xx_x>	15
DN	Get	Alias Name	Alias Name <Sxxx>	1
GN	Set	Alias Name	Alias Name, Max Length: 29bytes <xxx>	1
QP	Get	Module Status Checking	connection status_SSID_BSSID_CHAN_RATE_RSSI Conn_status: '0' is not connected, '1' is connected. <Sx_xxxx_xxxxxxxxxxx_xx_xxM_xx>	2
Security				
DU	Get	Security Status	AuthMode_Encrypt[_KeyLength_KeyFormat_KeyValue_radius Passwd_radiusIP_radiusPort] AuthMode: 0(Open or Shared), 1(Open), 2(802.1x), 3(Shared), 4(WPA), 5(WPA-PSK), 6(WPA2), 7(WPA2-PSK), Encrypt: 0(None),1 (WEP), 2(TKIP), 3(AES), 4(TKIP_AES) KeyLength: 0(None), 1(WEP64), 2(WEP128) KeyFormat(WEP): 0(Ascii), 1(Hex) KeyFormat(WPA-PSK): 0(Passphrase), 1(Hex) <Sx_x_x_x_x_x_x_x>	1
GU	Set	Security Control	AuthMode_Encrypt[_KeyLength_KeyFormat_KeyValue_radius Passwd_radiusIP_radiusPort] AuthMode: 0(Open or Shared), 1(Open), 2(802.1x), 3(Shared), 4(WPA), 5(WPA-PSK), 6(WPA2), 7(WPA2-PSK), Encrypt: 0(None),1 (WEP), 2(TKIP), 3(AES), 4(TKIP_AES) KeyLength: 0(None), 1(WEP64), 2(WEP128) KeyFormat(WEP): 0(Ascii), 1(Hex) KeyFormat(WPA-PSK): 0(Passphrase), 1(Hex) (WPA-PSK KeyValue:8~63byte) <x_x_x_x_x_x_x_x>	30
Serial				
RK	Get	Protocol	TCP_0, UDP_1 <Sx>	2

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WK	Set	Protocol	TCP_0, UDP_1 <x>	1
RM	Get	Mode	0:Client, 1:Mixed, 2:Server <Sx>	2
WM	Set	Mode	0:Client, 1:Mixed, 2:Server <x>	1
RX	Get	Server IP	Server IP address <Sxxx.xxx.xxx.xxx>	1
WX	Set	Server IP	Server IP address <xxx.xxx.xxx.xxx>	2
RP	Get	Port	0~65535 <Sxxxxx>	1
WP	Set	Port	0~65535 <xxxxx>	1
RB	Get	Baudrate_DataBit_Parity_Flow_Stopbits	eg. [Baudrate]1: 115200, 2: 57600, 3: 38400, 4: 19200, 5: 9600, 6: 4800, 7: 2400,8: 1200 [data byte] 7: 7bit, 8bit [parity] 0: no parity, 1: Odd, 2: Even [Flow] 0: no, 1: Xon/Xoff, 2: RTS/CTS [Stopbits]; 1: 1stop, 2:2stop <Sxxxxx>	2
WB	Set	Baudrate_DataBit_Parity_Flow_Stopbits	eg. [Baudrate]1: 115200, 2: 57600, 3: 38400, 4: 19200, 5: 9600, 6: 4800, 7: 2400,8: 1200 [data byte] 7: 7bit, 8bit [parity] 0: no parity, 1: Odd, 2: Even [Flow] 0: no, 1: Xon/Xoff, 2: RTS/CTS [Stopbits]; 1: 1stop, 2:2stop <xxxxx>	5
QT	Get	Time	0~65535 <Sxxxxx>	1
OT	Set	Time	0~65535 <xxxxx>	1
QS	Get	Size	0~255 <Sxxx>	1

OS	Set	Size	0~255 <Sxxx>	1
QC	Get	Char	00~ff <Sxx>	1
OC	Set	Char	00~ff <xx>	1
QI	Get	Inactivity Time	00~60 <Sxx>	1
OI	Set	Inactivity Time	00~60 <xx>	1
RC	Get	Connection Status(Server :Client)	0: Not Connect, 1:Connect <Sx>	1
Others				
WF	Set	Factory Default	<WF>	55
WR	Set	Restart	<WR>	55

error code	S	<S> or <Sxx…>	Commend is successfully applied
	F	<F>	Failed to apply
	0	<0>	"<" is wrong
	1	<1>	There is not in command list
	2	<2>	Wrong Parameter factor
	3	<3>	">" is wrong
	4	<4>	Do not work in current mode
	5	<5>	No more add list. **-Limit-** *WDS: 4 list *ACL: 16 list

Notice	If input "_" in fact, should input"__" instead of "_". For example SSID, PSK etc. <DS> --> <S11__22>: SSID: 11_22 <GS11_22> --> <S>: SSID: 11_22 <QP> --> <S1_11__22_000102030405_...>: SSID: 11_22
	If multi command input, response time be delayed For example DA, GA, DW, GW
	Security Available mode **AP/GW Mode** AuthMode: 0-7 EncryptType: 0-3 **Client Mode** AuthMode: 1,3,5,7 EncryptType: 0,1,4

**Security Example parameter <GU5_2_0_0_12345678> <GU4_2_0_0_12345678_abcd_192.168.123.111_1812>

APC hero
01480 226600
sales@apc-hero.co.uk

5. Warranty

WIZnet Co., Ltd offers the following limited warranties applicable only to the original purchaser. This offer is non-transferable.

WIZnet warrants our products and its parts against defects in materials and workmanship under normal use for period of standard ONE(1) YEAR for the WIZ6000 board and labor warranty after the date of original retail purchase. During this period, WIZnet will repair or replace a defective products or part free of charge.

Warranty Conditions:

1. The warranty applies only to products distributed by WIZnet or our official distributors.
2. The warranty applies only to defects in material or workmanship as mentioned above in 6.Warranty. The warranty applies only to defects which occur during normal use and does not extend to damage to products or parts which results from alternation, repair, modification, faulty installation or service by anyone other than someone authorized by WIZnet Inc. ; damage to products or parts caused by accident, abuse, or misuse, poor maintenance, mishandling, misapplication, or used in violation of instructions furnished by us ; damage occurring in shipment or any damage caused by an act of God, such as lightening or line surge.

Procedure for Obtaining Warranty Service

1. Contact an authorized distributors or dealer of WIZnet Inc. for obtaining an RMA (Return Merchandise Authorization) request form within the applicable warranty period.
2. Send the products to the distributors or dealers together with the completed RMA request form. All products returned for warranty must be carefully repackaged in the original packing materials.
3. Any service issue, please contact to sales@wiznet.co.kr